

Page 26, line 20, change "imbedded" to --embedded--.

Page 26, line 24, change "vise" to --vice--.

Page 27, line 2, change "column" to --structure--.

Page 27, line 15, change "magnetic" to --non-magnetic--.

Page 28, line 9, change "6" to --8--.

Page 29, line 10, change "embodiment" to --embodiments--.

Page 29, line 11, change "is" to --are--.

## In the Claims

Amend the following claims:

1        1. (Amended) A head for use in a magnetic recording system including a  
2        magnetic media with perpendicular magnetic polarity transitions written thereon and  
3        circuitry adapted to receive a readback pulse with a substantially Lorentzian pulse shape  
4        from said head, said head for transferring data between the magnetic media and an  
5        exterior environment, said head comprising:  
6                a write element for inducing said perpendicular magnetic polarity transitions into  
7        a surface of said magnetic media during a write operation; [and]  
8                a yoke disposed within said write element, said yoke having a read gap for  
9        sensing said perpendicular magnetic polarity transitions; and  
10        a magnetoresistive read element mounted in a flux flow path of said yoke,  
11        wherein said magnetoresistive read element produces a readback pulse having a  
12        substantially Lorentzian pulse shape in response to one of said perpendicular magnetic  
13        polarity transitions.

### The magnetic recording system

1        2. (Amended) The head, as claimed in Claim 1, wherein said flux flow path  
2        includes a read flux flow path integral with a write flux flow path [further comprising:  
3        a magnetoresistive element mounted in a flux flow path of said yoke].

*A3*

The magnetic recording system

1       3. (Amended) The head, as claimed in Claim 1 [2], wherein said read gap of said  
2       yoke is disposed at a first distance from said magnetic media and said magnetoresistive  
3       read element is disposed at a second distance from said magnetic media, said first  
4       distance being smaller than said second distance.

*A3*

The magnetic recording system

1       4. (Amended) The head, as claimed in Claim 1 [2], wherein said  
2       [magnetoresistive element produces a readback pulse having a] substantially Lorentzian[-  
3       type] pulse shape includes a peak near zero head position with respect to said one of said  
4       perpendicular magnetic polarity transitions.

*A4*

The magnetic recording system

1       8. (Amended) The head, as claimed in Claim 1, wherein  
2       said write element comprises first and second write poles, wherein said first and  
3       second write poles have first and second cross-sectional areas [widths], respectively,  
4       said second [first] cross-sectional area [width] being larger than said first [second]  
5       cross-sectional area [width].

*A4*

The magnetic recording system

1       9. (Amended) The head, as claimed in Claim 8, wherein said second [first] cross-  
2       sectional area [width] is about 10 to 100 times larger than said first [second] cross-  
3       sectional area [width].

*A4*

The magnetic recording system

1       10. (Amended) The head, as claimed in Claim 1, wherein said yoke includes  
2       [further comprising:  
3           first, second and third pole pieces wherein said] first, second and third pole pieces  
4           [are] in a common plane with said read gap, said common plane being defined by  
5           masking during fabrication.

17. (Amended) A magnetic storage device comprising:  
a magnetic media having magnetic polarity transitions perpendicularly recorded  
thereon; [and]  
a read element for reading said perpendicular magnetic polarity transitions, said  
read element including:  
a flux guide [flux-guide] having a read gap, said read gap used for sensing  
said perpendicular magnetic polarity transitions and for producing a magnetic flux in said  
[flux-guide] flux guide in response to each of said perpendicular magnetic polarity  
transitions, and  
a magnetoresistive element mounted in said flux guide for producing a  
readback pulse having a substantially Lorentzian pulse shape in response to said magnetic  
flux; and  
circuitry adapted to receive a readback pulse having a substantially Lorentzian  
pulse shape from said magnetoresistive element.

18. (Amended) The magnetic storage device, as claimed in Claim 17, wherein  
said substantially Lorentzian pulse shape includes a peak near zero head position with  
respect to and in response to one of said perpendicular magnetic polarity transitions [read  
element further includes:  
a magnetoresistive element mounted in said flux-guide for sensing said magnetic  
flux within said flux guide].

20. (Amended) The magnetic storage device, as claimed in Claim 17, wherein  
said circuitry includes [further comprising:]  
means for filtering said [a] readback signal so that said readback signal has a  
greater resemblance to an ideal Lorentzian pulse shape [produced by said read element,  
wherein said means for filtering produces a signal having a substantially Lorentzian  
pulse-shape].

1           21. (Amended) The magnetic storage device, as claimed in Claim 17, further  
2 comprising:

3           a write element for writing said perpendicular magnetic polarity transitions on  
4 said magnetic media, said write element including:

5           first and second write poles having [a] first and second ends, respectively,  
6 said first and second ends located proximate to a surface of said magnetic media;

7           a coil element operatively coupled to said first and second write poles for  
8 writing to said magnetic media.

1           22. (Amended) The magnetic storage device, as claimed in Claim 21, wherein  
2 said first and second write poles comprise first and second cross-sectional areas [widths],  
3 respectively,

4           said second [first] cross-sectional area [width] being larger than said first [second]  
5 cross-sectional area [width].

1           23. (Amended) The magnetic storage device, as claimed in Claim 22, wherein  
2 said second [first] cross-sectional area [width] is about 10 to 100 times larger than said  
3 first [second] cross-sectional area [width].

1           27. (Amended) The magnetic storage device, as claimed in Claim 17, wherein  
2 said magnetic media is a rotating disk [read element produces a readback pulse having a  
3 substantially Lorentzian pulse shape].

1           29. (Amended) The magnetic storage device, as claimed in Claim 17, wherein  
2 said read element floats above [is in virtual contact with] said magnetic media on a  
3 cushion of air during a read operation.

Add the following claims:

1        30. A magnetic storage device comprising:  
2            a magnetic storage media;  
3            a head including a write element for inducing perpendicular magnetic polarity  
4            transitions in said magnetic storage media during a write operation, a yoke, and a  
5            magnetoresistive read element mounted in a flux flow path of said yoke and recessed from  
6            said magnetic storage media for producing readback pulses with substantially Lorentzian  
7            pulse shapes in response to and in one-to-one correspondence with said perpendicular  
8            magnetic polarity transitions during a read operation; and  
9            circuitry adapted for receiving readback pulses with substantially Lorentzian pulse  
10          shapes from said magnetoresistive read element.

1        31. The magnetic storage device, as claimed in Claim 30, wherein said  
2            magnetoresistive read element is sufficiently recessed from said magnetic storage media  
3            to prevent thermal asperities in said magnetoresistive read element.

1        32. The magnetic storage device, as claimed in Claim 30, wherein said  
2            magnetoresistive read element is sufficiently recessed from said magnetic storage media  
3            to prevent electrostatic discharge between said magnetoresistive read element and said  
4            magnetic storage media.

1        33. The magnetic storage device, as claimed in Claim 30, wherein said  
2            magnetoresistive read element is sufficiently recessed from said magnetic storage media  
3            to prevent chemicals on said magnetic storage media from corroding said  
4            magnetoresistive read element.

*Sub C*  
1        34. The magnetic storage device, as claimed in Claim 30, wherein said  
2        circuitry includes a detector designed to detect Lorentzian pulse shapes.

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1        35. The magnetic storage device, as claimed in Claim 34, wherein said  
2        detector is a class-4 partial response (PR4) detector.

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1        36. The magnetic storage device, as claimed in Claim 34, wherein said  
2        detector is a peak detector.

30  
1        37. The magnetic storage device, as claimed in Claim 34, wherein said  
2        detector receives said readback pulses.

*AG*  
30  
1        38. The magnetic storage device, as claimed in Claim 34, wherein said  
2        circuitry includes a high pass filter that receives said readback pulses and provides  
3        filtered readback pulses, which more closely resemble ideal Lorentzian pulse shapes than  
4        said readback pulses, to said detector.

30  
1        39. The magnetic storage device, as claimed in Claim 34, wherein said  
2        magnetic storage device is devoid of a high pass filter between said magnetoresistive read  
3        element and said detector.

30  
1        40. The magnetic storage device, as claimed in Claim 34, wherein said  
2        magnetic storage device is devoid of a differentiator between said magnetoresistive read  
3        element and said detector.

30  
1        41. The magnetic storage device, as claimed in Claim 34, wherein said  
2        magnetic storage device is devoid of signal processing circuitry between said  
3        magnetoresistive read element and said detector.

1           42. The magnetic storage device, as claimed in Claim 30, wherein said  
2 magnetic storage media includes a magnetic underlayer and a recording media such that  
3 the orientation of a magnetic easy axis is perpendicular to a top surface of said magnetic  
4 storage media.

1           43. The magnetic storage device, as claimed in Claim 30, wherein said  
2 readback pulses have peaks near zero head positions with respect to said perpendicular  
3 magnetic polarity transitions.

1           44. The magnetic storage device, as claimed in Claim 30, wherein said  
2 readback pulses are substantially symmetric about zero head positions with respect to said  
3 perpendicular magnetic polarity transitions.

1           45. The magnetic storage device, as claimed in Claim 30, wherein said  
2 readback pulses have peaks near and are substantially symmetric about zero head  
3 positions with respect to said perpendicular magnetic polarity transitions.

1           46. The magnetic storage device, as claimed in Claim 45, wherein said  
2 readback pulses have a single voltage polarity with respect to a baseline voltage between  
3 said readback pulses.

1           47. The magnetic storage device, as claimed in Claim 30, wherein said yoke  
2 includes a write flux guide that provides a write gap and a read flux guide that provides  
3 a read gap, and said read flux guide is integral with and positioned within said write flux  
4 guide.

1           48. The magnetic storage device, as claimed in Claim 47, wherein said yoke  
2 includes first, second and third pole pieces, said first and third pole pieces are in said  
3 write flux guide and provide write poles that define said write gap, and said first and  
4 second pole pieces are in said read flux guide and provide read poles that define said read  
5 gap.

1           49. The magnetic storage device, as claimed in Claim 48, wherein said first,  
2 second and third pole pieces are substantially aligned with one another and define a plane  
3 that is substantially parallel to a top surface of said magnetic storage media.

1           50. The magnetic storage device, as claimed in Claim 48, wherein said  
2 magnetoresistive read element connects said first and second pole pieces.

1           51. The magnetic storage device, as claimed in Claim 48, wherein said yoke  
2 includes a non-magnetic spacer in said write flux guide that prevents magnetic flux from  
3 circulating through said write flux guide during a read operation.

1           52. The magnetic storage device, as claimed in Claim 48, wherein said first,  
2 second and third pole pieces are part of an air bearing surface that floats above said  
3 magnetic storage media on a small cushion of air during read and write operations.

1           53. The magnetic storage device, as claimed in Claim 48, wherein said first,  
2 second and third pole pieces contact said magnetic storage media during read and write  
3 operations.

1           54. The magnetic storage device, as claimed in Claim 48, wherein said first,  
2 second and third pole pieces contact a lubricant on a top surface of said magnetic storage  
3 media during read and write operations.

1           55. The magnetic storage device, as claimed in Claim 48, wherein said head  
2 includes write coils disposed between said first and third pole pieces but not between said  
3 first and second pole pieces.

1           56. The magnetic storage device, as claimed in Claim 48, wherein said head  
2 includes write coils disposed between said first and second pole pieces.

1           57. The magnetic storage device, as claimed in Claim 30, wherein said yoke  
2 includes a write flux guide that defines a write gap and a read flux guide that defines a  
3 read gap and is separate from said write flux guide.

1           58. The magnetic storage device, as claimed in Claim 30, wherein said  
2 magnetoresistive read element is positioned within said write element.

1           59. The magnetic storage device, as claimed in Claim 30, wherein said  
2 magnetic storage device is a tape drive.

1           60. The magnetic storage device, as claimed in Claim 30, wherein said  
2 magnetic storage device is a disk drive.